THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LAMBERTUS POSTMA

Appeal No. 96-1841
Application 08/101,324[1]

ON BRIEF

Before JERRY SMITH, BARRETT, and TORCZON, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

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[1] Application for patent filed August 2, 1993, entitled "Magnetic Head Having A Multilayer Structure And Method Of Manufacturing The Magnetic Head," which claims the foreign filing priority benefit under 35 U.S.C. § 119 of European Patent Office Application 92202435.1, filed August 6, 1992.

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1-6 and 8-16. Claim 7 has been canceled.

We affirm.

BACKGROUND

The disclosed invention is directed to the structure of a magnetic head for detecting a magnetic field.

Claim 1, the sole independent claim, is reproduced below.

> 1. A magnetic head for detecting a magnetic field representing information recorded on a magnetic recording medium, said magnetic head having a head face and comprising a multilayer structure with at least one magnetoresistive layer of magnetic anisotropic material, said magnetoresistive layer having a central portion forming a magnetoresistive element located between two end portions, said magnetoresistive layer having a longitudinal axis directed from one end portion to the other end portion, said magnetoresistive element having an easy axis of magnetization extending at least substantially parallel to the longitudinal axis, an electrically conducting layer provided on one side of said magnetoresistive layer, said conducting layer comprising at least one equipotential strip which extends at an angle to the longitudinal axis, characterized in that located opposite each end portion, on a side of the magnetoresistive element remote from the conducting layer is a facing layer of hard-magnetic material having an axis of magnetization extending parallel to the longitudinal axis of the magnetoresistive layer, and in that a non-magnetic spacer layer of electrically insulating material is

present between each end portion and the facing layer of hard-magnetic material.

The examiner relies on the following prior art references:

Kuijk (Kuijk '748)	4,052,748	October 4, 1977
Smith	4,903,158	February 20, 1990

We note that the examiner cites Kuijk, U.S. Patent 4,122,505 (Kuijk '505), issued October 24, 1978, in the listing of prior art relied upon in the rejection (Examiner's Answer, page 2), while the statement of the rejection in the Final Rejection and the Examiner's Answer relies on Kuijk '748. In the Examiner's Answer, the examiner appears to confuse Kuijk '505 with Kuijk '748 since the examiner's references to line numbers (e.g., col. 1, lines 38-59 and lines 38-37 cited in the Examiner's Answer, page 5) correspond exactly to paragraphs in Kuijk '505 and references to element numbers (i.e., electrical layer 4/5/9 mentioned in the Examiner's Answer, page 5) correspond to element numbers in Kuijk '505. We treat the rejection as being over Kuijk '748 to be consistent with the statement of the rejection.

Claims 1-6 and 8-16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Smith and Kuijk '748.

We refer to Final Rejection (Paper No. 9) (pages referred to as "FR__") and the Examiner's Answer (Paper No. 16) (pages referred to as "EA__") for a statement of the examiner's position and to the Substitute Appeal Brief received August 30, 1995, (Paper No. 15) (pages referred to as "Br__") for a statement of appellant's position.

OPINION

Claims 1-6 and 8-16 are argued to stand or fall together. Accordingly, the claims stand or fall together with claim 1. In the examiner's statement that "Appellant's brief includes a statement that claims 1-6 and 8-16 stand or fall together and provides reasons as set forth in 37 C.F.R. § 1.192(c)(5) and (c)(6)," (emphasis added) (EA2), the underlined portion should have been omitted since it applies only when appellant desires to argue the claims separately. We note, however, that there appears to be no form paragraph in the Manual of Patent Examining Procedure § 1208 which covers the situation where the claims are argued to stand or fall together.

The level of ordinary skill is not argued, so we find the patents to Smith and Kuijk '748, applied in the

rejection and the patent to Krounbi et al., U.S. Patent 5,005,096, incorporated by reference into appellant's specification, to be representative of the level of ordinary skill in the art. See In re Oelrich, 579 F.2d 86, 91, 198 USPQ 210, 214 (CCPA 1978) ("the PTO usually must evaluate both the scope and content of the prior art and the level of ordinary skill solely on the cold words of the literature"); In re GPAC Inc., 57 F.3d 1573, 1579, 35 USPQ2d 1116, 1121 (Fed. Cir. 1995) (the Board did not err in adopting the approach that the level of skill in the art was best determined by the references of record). In addition, those of ordinary skill in the art must be presumed to know something about the art apart from what the references expressly disclose. In re Jacoby, 309 F.2d 513, 516, 135 USPQ 317, 319 (CCPA 1962).

We agree with the examiner's conclusion that "[i]t would have been obvious to a person of ordinary skill in the art at the time the invention was made to bias the MR head of Smith with slanted equipotential strips as suggested by Kuijk ['748]" (EA4). It is considered well known to those of ordinary skill in the MR sensor art that it is necessary

to provide two bias fields for an MR head to operate optimally: one bias field to bias the MR material so that its response to a flux field is linear and one bias field in the longitudinal direction to suppress Barkhausen noise which originates from multi-domain activities in MR elements. The clearest statement of this is found in the admitted prior art to Krounbi (col. 1), incorporated by reference in the specification at page 3, which is considered knowledge of those of ordinary skill in the art. However, Smith also describes these two bias fields (col. 1, line 28 to col. 2, line 32). As to the linearizing bias field, Smith states (col. 1, lines 35-38): "As is fairly conventional, source of hard (vertical) axis bias field, provided for through a variety of means, biases the ordinarily longitudinal moment to an orientation, as depicted." Smith discloses using a permalloy layer 32, which is magnetized by current through the sense film 33 "so as to set up a hard axis bias field which biases the moment of the film 33 at about 45E relative to the direction of current flow . . ." (col. 2, lines 64-66). Kuijk '748, which is incorporated by reference into the specification at

page 1, describes a structure having equipotential strips for biasing the MR material so as to linearize the reproduction. In our opinion, one of ordinary skill in the MR sensor art would have recognized that the structure in Kuijk '748 could be substituted as one of the "variety of means" to bias the MR element in Smith. Appellant does not argue why such a substitution of one well-known biasing structure for another would have been nonobvious to one having ordinary skill in the MR sensor art. In addition, we refer to the discussion of Krounbi, infra, for its teaching of using alternate biasing techniques.

We also agree with the examiner's statement that "[a]lternatively, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the MR head of Kuijk ['748] with a hard-magnetic layer and spacer as taught by Smith" (EA5). The two bias fields provide separate functions. One skilled in the MR art would have sought to use the hard-magnetic material 42 and insulating layer 40 as taught in Smith with a MR head for the described purpose of suppressing Barkhausen noise.

Appellant argues that "[s]ince the Koijak [sic] patent and the Smith patent are directed to completely unrelated problems a person of ordinary skill in the art would find nothing in these patents to combine their teachings" (Br7). The examiner states that both Smith and Kuijk '748 are "both concerned with linearizing the output signal of a head" (EA7-8) and "[b]oth Smith and Kuijk bias the MR head about 45 degrees relative to the current flow" (EA8). Since both Kuijk '748 and Smith are in the same field endeavor of MR sensors, one of ordinary skill in the art would have recognized that the teachings of one could be applied to the other. The suggestion to modify the references has been discussed, supra.

Appellant further argues that the combination of teachings of Kuijk and Smith would not produce the claimed invention because a person of ordinary skill would follow the teachings of Smith in which the electrically conducting layer (the bonding pads 34 and 36) is between the magnetoresistive element and the spacer layer of electrically insulating material, whereas claim 1 calls for the spacer layer to be on a side of the magnetoresistive

layer remote from the electrically conducting layer. In the Final Rejection, the examiner concluded that, with respect to the order of layers, it would have been obvious to rearrange the layers of Smith in a particular sequence "since it is [sic, was] well within the purview of a skilled artisan and absent an unobvious result" (FR4). Appellant does not provide any argument why this statement is erroneous. In the Examiner's Answer, the examiner states that one of ordinary skill in the art "would have realized that as long as the hard layer is enclosed by non-magnetic layers and as long as the MR layer is contacting the electrical layer the arrangement with respect to the substrate need not be in a specific order" (EA6 and EA9).

We agree with the examiner that one of ordinary skill in the art had sufficient skill to reorder the sequence of layers, e.g., for manufacturing reasons. It would have been more persuasive to us if the examiner had cited a reference. However, appellant does not contest the examiner's statement that rearrangement is within the knowledge and skill of one in the art of MR sensors. It may be that the examiner's statement is not contested because of the teachings of

Krounbi, incorporated by reference in the specification at page 3. Figure 3 of Krounbi discloses an electrical conductor layer 26, hard magnetic layer 16, nonmagnetic spacer layer 18, MR layer 11, nonmagnetic spacer layer 22, and soft magnetic film layer 20, in that order. The soft magnetic layer 20 in Krounbi evidently serves the same function of biasing the MR element as the magnetically soft material layer 32 in Smith. Krounbi states (col. 4, lines 53-62):

> [I]t will be understood by those skilled in the art that various other changes in the form and details may be made therein without departing from the spirit and scope of the invention. For example, the conductor leads may be placed on the opposite side of the MR layer, if desired, and the MR sensor may also include other layers as is known in the art such as biasing layers, for example. Alternate transverse biasing techniques such as electrical shunt bias, and barberpole can also be used in the active region 12 of the MR sensor 10. [Emphasis added.]

Therefore, the admitted prior art incorporated by reference into appellant's specification discloses that one of ordinary skill in the art would have understood that the layers could be reordered, including, expressly, locating the conductive leads on the opposite side of the MR layer from the hard magnetic layer and nonmagnetic spacer layer.

This supports our conclusion that it would have been obvious to locate the electrically conducting layer in Smith (bonding pads 34 and 36) on the opposite side of the MR film 33, between the magnetic insulating coating 31 and the MR film 33. In addition, the last sentence quoted above indicates that a "barberpole" bias technique could be used in place of the layer of soft magnetic material, which apparently refers to the use of equipotential strips (see Kuijk '505). This supports our conclusion that it would have been obvious to substitute equipotential strips for a layer of soft magnetic material. Because Krounbi discloses a barberpole as an alternative bias technique, we disagree with appellant's description of the teachings of Krounbi in the specification at page 3.

For the reasons stated above, the rejection of claims 1-6 and 8-16 is sustained.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

JERRY SMITH Administrative Patent Judge	)	
LEE E. BARRETT Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
RICHARD TORCZON Administrative Patent Judge	)	

U.S. PHILIPS CORPORATION
Intellectual Property Department
580 White Plains Road
Tarrytown, NY 10591